



## *Neoclitocybe infuscata*: a new species from Atlantic Forest of Pernambuco State, Brazil

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### Abstract

*Neoclitocybe infuscata* is a new species from the Brazilian Atlantic forest. It is characterized macroscopically by the grayish brown pileus with a shallow sulcate surface; microscopically by ellipsoid to elongate basidiospores, lacking pleuro- and caulocystidia, abundant cheilocystidia, a sarcodimitic context and pileipellis with rameales-structure and diverticulate terminal elements.

**Key words** – Agaricales – neotropics – taxonomy – Tricholomataceae

### Introduction

*Neoclitocybe* Singer is a genus characterized by a clitocyboid to omphalioid, rarely pleurotoid habit, a pileipellis with a distinct *Rameales*-structure, and smooth, inamyloid spores (Singer 1986). According to Largent et al. (1986: 50) the term ‘*Ramelaes*-structure’ is also used for species on which the pileipellis hyphae have short vertical branches (in this case, knobs). This genus differs from *Clitocybe* (Fr.) Staude in the distinct basal mycelium and the ‘*Rameales*-structure’ (i.e. hyphae with diverticulate elements according to Largent et al. 1986) of the pileipellis (Singer 1986).

A list made by Putzke (1994) for Brazilian species reported nine species: *N. byssiseda* (Bres.) Singer, *N. irregularis* (Rick) Singer, *N. nauseosa* (Rick) Singer, *N. nivea* (Rick) Singer, *N. subnimbata* (Rick) Singer, *N. viridilutea* (Rick) Singer for Rio Grande do Sul (South Brazil); and *N. euomphala* (Berk.) Singer and *N. ciliata* Singer from Amazonas (North Brazil). In Northeast Brazil, only one species is known, *N. sublateralis* Singer for Pernambuco (Singer 1965).

This manuscript presents a new species of *Neoclitocybe* from Northeast Brazil, with a description and drawings.

### Materials & Methods

The basidiomes were collected at the “Refúgio Ecológico Charles Darwin” (07°48’37”–07°49’02” S and 34°27’25”–34°56’52” W), is protected private area about 60 ha, located at municipality of Igarassu, in the State of Pernambuco, Northeast Brazil (Costa-Lima 1998).

For macroscopic studies, Singer (1986) was followed. Color codes and numbers are based on Online Auction Color (2004). For better view of the cells Congo red reagent was used, except

the basidiospores that were measured in Melzer's reagent. Statistics are based on 30 basidiospores measured. Abbreviations include L(W) = basidiospore length (width) average from a single basidiome, Q = the length : width ratio range as determined from all measured basidiospores, and Q<sub>m</sub> = the Q value averaged from all basidiospores. MycoBank and Facesoffungi numbers are provided as explained in Crous et al. (2004), Robert et al. (2013) and Jayasiri et al. (2015). The holotype is deposited at JPB (Thiers, continuously updated).

## Taxonomy

*Neoclitocybe infuscata* Sá & Wartchow, **sp. nov.**

Figs. 1–5

MycoBank: MB 815269

Facesoffungi number: 02680

Etymology – From Lat. 'infuscata' (=darkened). Due to dark grayish brown pileus of the new species.

Basidiome small. Pileus 18–20 mm, depressed, dark grayish-brown (OAC 41), surface shallowly sulcate from the center to the margin; margin downturned; context 0.3 mm thick at centre, gradually thinning towards the margin. Lamellae decurrent with short teeth, subdistant, cream-buff (between OAC753 and OAC 760), 2 mm broad; lamellulae frequent. Stipe 23–34 × 0.2 mm, central, grayish brown (OAC 41), subcylindrical, slightly tapering above, smooth and hollow.

Basidiospores [30/1/1] (6–)6.5–8.3(–8.5) × 4–4.5(–5) μm, L = 7.2 μm, W = 4.3 μm, Q = (1.44–)1.50–1.88(–1.89), Q<sub>m</sub> = 1.69 μm; ellipsoid to elongate, thin-walled, inamyloid, hyaline in 3% KOH, guttulate. Basidia 25–40 × 6–8.5 μm, clavate, with 4 sterigmata 1.5–4.5 μm high. Pleurocystidia absent. Lamella edge sterile with crowded and prominent cheilocystidia. Cheilocystidia 22–45 × 3–6.5 μm, fusoid to fusoid-ventricose, thin-walled, hyaline in KOH 3%. Lamella trama subregular, sarcodimitic, composed of hyaline hyphae 2.6–5.1 μm wide, slightly thick-walled up to 0.5 μm. Pileus context distinctly sarcodimitic (see Singer 1986). Pileipellis as cutis, with transition to trichoderm in all surface, a *Rameales*-structure (*sensu* Largent et al. 1977) of septate diverticulate hyphae, frequently gradually ascending but not hymeniform, terminal elements cylindrical 25–55 × 5–10 μm frequently anticlinal, with occasional nodules, hyaline in KOH 3%, slightly thick-walled up to 0.5 μm, and hyphae 4–6 μm wide. Stipitipellis as cutis, composed of longitudinally orientated hyphae 3.8–5 μm wide, without caulocystidia. Clamp connections present in all tissues examined.

Distribution – State of Pernambuco.

Habitat – in pairs on soil in Atlantic Forest.

Type – BRAZIL. Pernambuco, Igarassu, Refúgio Ecológico Charles Darwin, 5 June 2012, F. Wartchow & N.A. Silva FW 44/2012 (JPB 61265, holotype).

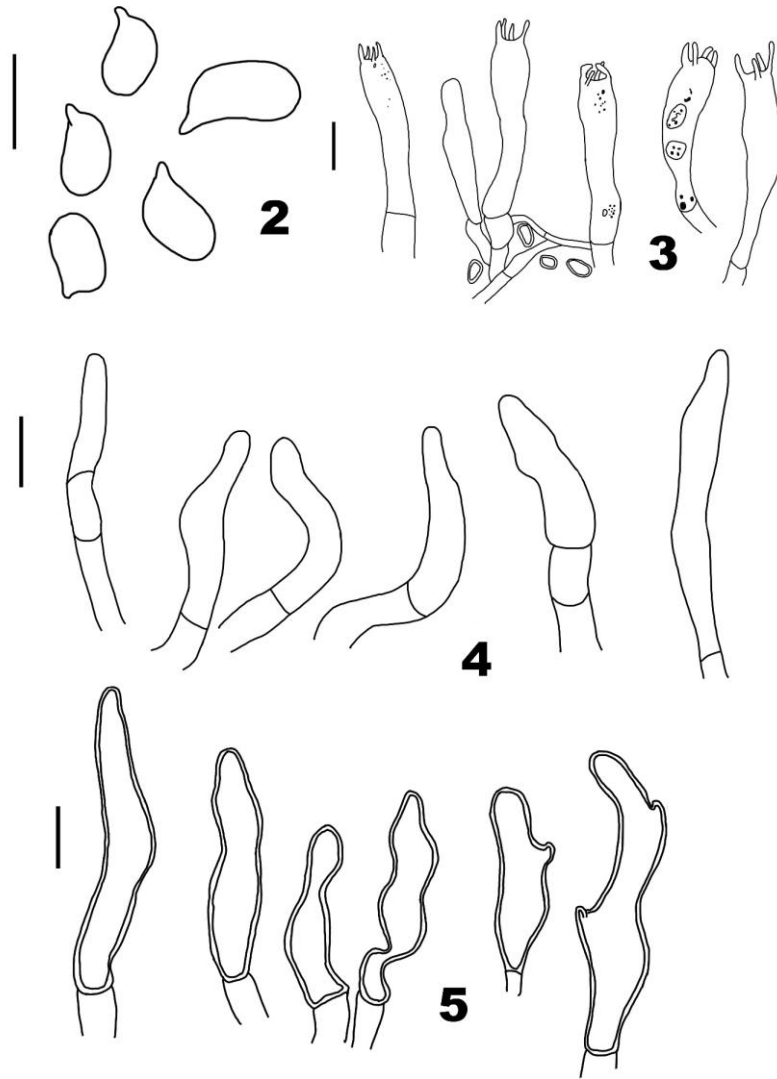
## Discussion

The key for the species presented by Singer & Grinling (1967) separates the species by the size of basidiospores, color of the pileus and lamellae, and *N. infuscata* falls in the group with basidiospores larger than 6 μm long and basidiomes without lilac tinges. They listed *N. subnimbata* and *N. omphalina* (Singer) Singer with these key characteristics.

*Neoclitocybe subnimbata* was revised by Singer (1953) under the name *Clitocybe subnimbata* Rick and clearly differs in the larger pileus (more than 20 mm), white to melleus lamellae and stipe base, smaller basidiospores 4.8–6.9 × 2.7–4.1 μm and rather elongate cheilocystidia that are very irregularly-shaped and some forked or with nodules or protuberances (Singer & Grinling 1967). *Neoclitocybe omphalina* (Singer) Singer from northwestern Argentina (as "*Marasmiellus omphalina* Singer" in Singer & Digilio 1952) also has a brown, 9–17 mm pileus, but differs in its pileus surface which is radially fibrillose to fibrillose-rimose, glabrous, umbilicate and irregularly sulcate; and white lamellae; the stipe is concolorous to the pileus,



**Fig. 1** – *Neoclitocybe infuscata* (holotype). Basidiomata *in situ*. Bar = 10 mm.



**Figs 2–5** – *Neoclitocybe infuscata* (holotype). **2.** Basidiospores. **3.** Basidia, basidiole and subhymenium. **4.** Cheilocystidia. **5.** Terminal elements of the pileipellis. Bars = 10  $\mu$ m.

up to  $7\text{--}20 \times 1\text{--}1.5$  mm and context white; microscopically the basidiospores are slightly larger  $7.5\text{--}9.5 \times 4\text{--}4.8$   $\mu\text{m}$ , ellipsoid with a suprahilar depression; cheilocystidia not abundant,  $26\text{--}37 \times 5.5\text{--}9.7$   $\mu\text{m}$ , filamentous to ventricose, sometimes with different shapes, and pileipellis a cutis without diverticulate elements (Singer & Digilio 1952).

*Neoclitocybe latispora* Singer from Argentina has fuscous pileus measuring 22–46 mm, distinctly larger basidiospores  $(7\text{--})8.5\text{--}8.8(11.3) \times (5.5\text{--})7\text{--}7.3(9.3)$   $\mu\text{m}$ , fusoid cheilocystidia with furcated-ramose apex  $20\text{--}27 \times 4.7\text{--}8.5$   $\mu\text{m}$  and pileipellis as a cutis without any mention of nodules or diverticulate elements (Singer 1973).

Singer (1989) described two additional species. *Neoclitocybe sanctarosae* Singer from Bolivia differs in the brown to subolivaceous pileus and stipe, white lamellae, narrower basidiospores  $6.7\text{--}8 \times 3.2\text{--}4$   $\mu\text{m}$ , cheilocystidia  $25\text{--}35 \times 2.5\text{--}5$   $\mu\text{m}$  that are filamentous subventricose to constricted and hyalines, and gelatinous pileipellis as cutis with some erect elements and without diverticulate structures (Singer 1989). *Neoclitocybe ciliata*, a species from Amazonia, differs in the cinnamon pileus, lamellae and stipe, narrower basidiospores  $6.5\text{--}9 \times 2.5\text{--}3.7$   $\mu\text{m}$ , presence of ampulaceous or fusoid-ventricose pleurocystidia  $15\text{--}20 \times 4\text{--}6$   $\mu\text{m}$  and larger cheilocystidia  $45\text{--}70 \times 3.2\text{--}5.5$   $\mu\text{m}$  (Singer 1989).

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